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W. Gardner

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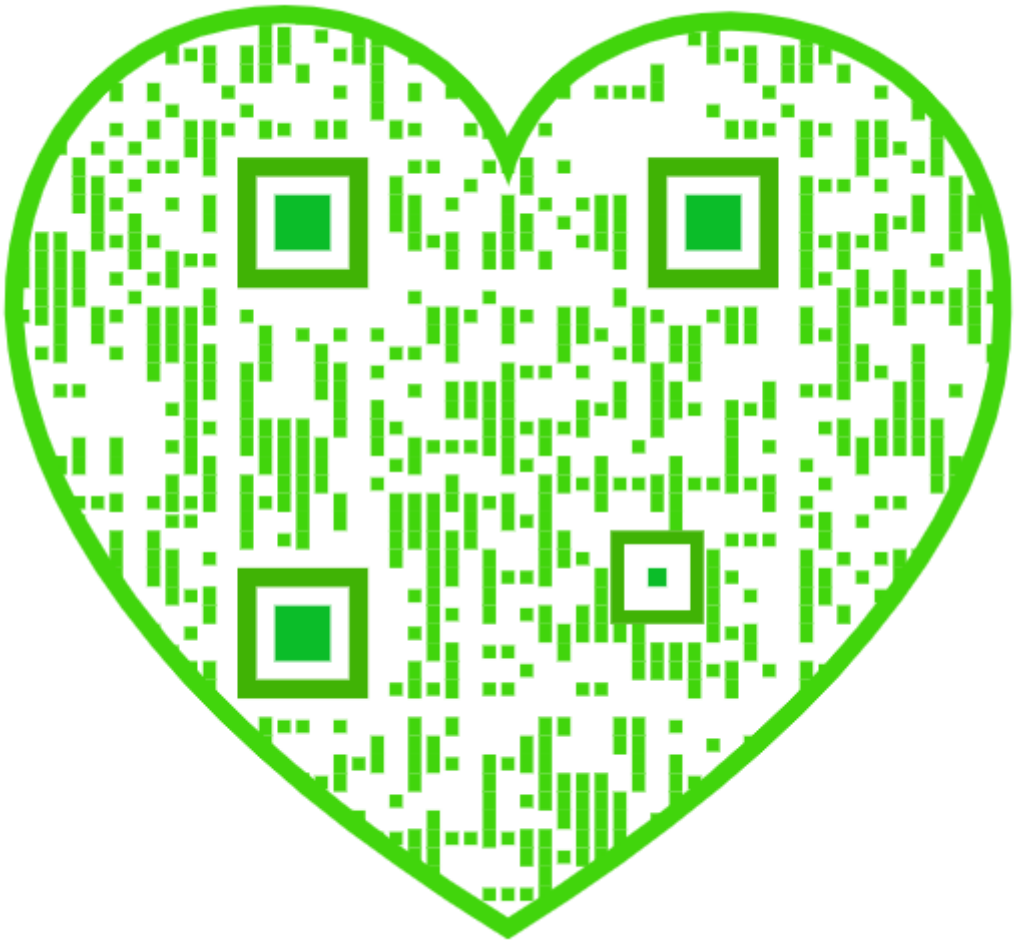
THE AMERICAN METHOD of CARRIAGE PAINTING.



The American Method

OF

Carriage Painting,

By F. B. GARDNER.

The Deviltries of Varnish,

By G. W. W. HOUGHTON,

(Editor of "The Hub.")

Fourth Edition, Revised and Corrected.

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PREFACE.

AT the solicitation of many friends and brother painters, to put upon paper a plain statement of the method of painting employed by the best New-York carriage-builders—particularly by Brewster & Co. (of Broome Street), by whom I was formerly employed—I have, in the following article, written out the most important facts relative thereto, and hope they will merit careful reading, and possibly shed a few rays of light in the corners of some carriage, wagon or car paint-shop.

That good results will follow the employment of the "American Method," here described, need not be questioned, for demonstration of the fact may be had at any time by examining the work of several leading firms in this city who employ this method, and who will testify to the accuracy with which I have given its details.

F. B. GARDNER.

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THE

AMERICAN METHOD OF CARRIAGE PAINTING.

HOW TO PAINT A CARRIAGE BODY.

THE body (either a heavy or light one) having been placed in the hands of the painter in good condition, the first operation should be to thoroughly dust off every part, and then apply the priming coat of Permanent Wood Filling.

Permanent Wood Filling is a liquid of about the same consistency as Varnish, and is supplied in cans of one and five gallons capacity. There are two shades, the "dark" and the "light," the former being generally used as a priming on carriage bodies, while the latter is better adapted for railway cars, or for work that is to be painted in light colors. However, one may be substituted for the other if desired, as they possess precisely the same qualities, with the single exception of *color*.

This priming may be applied either hot or cold, but it will be found to penetrate deeper into the wood, to work more freely, and to cover a greater extent of surface, if first warmed; this may be done in a common glue-kettle over the fire; but where gas is available the best plan of heating it is by the use of a small gas stove.

In no case should it be reduced with turpentine or oil, but it should be applied in its pure state. The parts of the body which are covered with canvas or muslin should be primed with "slush," and not with P.W.F., as too great an amount of the latter would be absorbed and kept in contact with the glue, which would be liable to soften the latter; but in no case will P.W.F. affect other glued parts of the job. To apply the P.W.F., take an ordinary clean bristle paint-brush, and, dipping it into the liquid, spread it on a portion of the body (say on a side panel), giving a moderately heavy coat. No great care need be taken to spread this evenly; it may even be daubed on roughly, for immediately afterward we proceed to rub the part thus coated with a piece of fine sand-paper, or, still better, some that is half-worn, with just sufficient grit to remove the fuzz of the wood. Then wipe off all the superfluous P.W.F.

with a clean rag, acting as if a mistake had been made, and it was necessary to wipe all the material from the surface. Proceed in the same way with the next panel, and so on until all the bare wood, inside and out, is coated. The inside and bottom of the body will not require sand-papering, but should be well wiped over with rags.

The object in rubbing the P.W.F. with sand-paper is to remove the fuzz, which always rises on moistened wood, which fuzz, being very fine and soft, is partially rubbed into the pores, thereby assisting as a filler; and besides, the rubbing forces the liquid still further into the wood. To simply lay a thin coating of P.W.F. on the wood, and allow it to "soak in," is not the proper way to prime a carriage body; and if you do not do the work properly, how can you expect good results?

The body being coated all over, set it aside for drying, and it will be found best to allow it 48 hours; but if in a great hurry, 24 hours will suffice, providing the job was well rubbed off after priming it.

You now ask, "What has this P.W.F. done?" The grain does not *appear filled;* and we answer as follows:

A priming, to be durable, should unite with the wood—grasping, as it were, the fibres, and penetrating into the pores, filling them, preventing the entrance of moisture, and thereby aiding to sustain the subsequent coats. At the same time, it should be composed of materials which, when dry or oxidized into resins, will possess sufficient elasticity to allow a slight change in the wood,—such as that given by severe jars, or by the expansion or contraction caused by a variation in temperature,—without cracking.

The oxidizing or hardening of paint must go on slowly and uniformly, otherwise elasticity of the surface and all cohesive power will be destroyed. Oil is boiled and siccatives added to render the oil more susceptible to the effects of oxygen, and thereby hasten its drying; but the boiling tends to destroy certain properties of the oil. Raw oil made siccative, or drying, by the admixture of driers *to the paint*, is therefore preferable, as it does not remove from the oil its penetrating properties. However, the paint thus mixed cannot be depended upon as a *filler* for the pores, for the oil, water-like, seeks the interior of the wood, and *coats* the pores, but does not fill or close them against moisture.

To fully meet the requirements of a good priming, the penetrative quality of the oil must be retained, and the body which supplies the quality of "filling" must consist of something which can be dissolved and mixed with the oil in a liquid form; in other words, the filling substance of the paint must be a liquid which will assimilate with the oil, and not, as in the case of a pigment, consist of a granular substances simply suspended in oil.

If we examine with a magnifying glass ordinary paint in its liquid state it will appear similar to fine gravel mixed with molasses, each little grain of

pigment being smeared with oil, varnish, or whatever liquids the paint may contain; and if it be spread on wood the grains will remain on the surface—they being too coarse to enter the pores, while the liquid will be sucked in. Now, on the other hand, if we mix a liquid with the oil to form the *filler*, no granular appearance will be observed, and if the oil penetrates the wood *the filler will go with it.*

The body, having been allowed ample time to dry, is ready for the rough-stuff, or "leveling paint;" and care should be taken *not to disturb the surface* of the body by rubbing with sand-paper or anything else, for there is a thin skin of oxidized P.W.F. covering every little fibre, which helps to protect the wood from dampness, and which, if broken, would be rendered useless. A simple dusting off prepares the body for the paint.

Much has been said and written about this leveling paint or rough-stuff, and it is not necessary to extend remarks on that subject in this connection. However, we will endeavor to show why a ready prepared article is best, by giving the reasons advanced by Brewster & Co.'s workmen, and others, who use prepared rough-stuff exclusively.

No matter how good a receipt the painter may have, or how carefully he may mix his rough-stuff, it is impossible for him to measure the proportions on a small scale as accurately as can be done on a large one. To a barrel of pigment we can easily add 10 gallons of each of the liquids used, and duplicate the mixture at different times, but the painter cannot so easily proportion the same ingredients in a cup; therefore at one time his paint will be more or less elastic than at another, and it is well known what effect a coat of extra elastic paint will have if placed under or between harder and less elastic ones. Besides, it is much handier to have the rough-stuff ready at all times, saying nothing of the cleanliness thereby gained, and the economy in time.

Valentine & Company furnish a ready prepared rough-stuff in two colors—"dark" for ordinary carriage work, and "light" for railway cars and work to be painted in light colors. It is prepared from a formula which long experience has proved the best, and is always uniform; while to prepare it for use, it is only necessary to thin it with turpentine to a proper working consistency.

Remember here that turpentine, being a volatile oil, evaporates very quickly from paint when left exposed to the air.

The first coat of rough-stuff should be made a little more elastic than the subsequent coats, that it may harmonize well with the elastic P.W.F. underneath, after which, the prepared rough-stuff, as received from the manufacturers, is in proper condition. The addition of 5 per cent. (*i. e.*, one part in

twenty) of raw linseed oil will produce the desired elasticity for the first coat, and 48 hours should be allowed for drying. The subsequent coats may be applied one each day, until all is on. Rough-stuff always makes the best job when moderately thin, spreading and drying better, but it should be well brushed down.

It is a mistake to apply heavy coats of rough-stuff; better a great deal to give an extra one. The precise number of coats a body requires depends entirely upon the quality of the woodwork. Four coats ought to be sufficient, and will be after some workmen, while other jobs require five or six to make a level surface.

Now, having applied the first elastic coat of rough-stuff, and allowed it 24 hours for drying, we may putty up the principal screw-holes and nail-holes with putty made as follows: Equal parts of dry white lead and keg-lead, mixed to a stiff dough with equal parts of Crown Coach Japan and Rubbing Varnish; after applying, allow all to harden for another 24 hours. The other coats of rough-stuff, having *no oil added*, may be applied one coat each day; after which a stain or "guide coat" should be given; the latter may be made of any cheap pigment, differing in color from that of the rough-stuff. Yellow ochre mixed with japan and turpentine is considered good as a guide coat, owing to its "grit," which helps to scour off the outer coats, and to hasten the rubbing process; the addition of pulverized pumice-stone to the "stain" will also be found beneficial for the same reason.

When all the rough-stuff and stain is *dry*, which will be in, say, 48 hours, the work of "rubbing out" may be commenced. The stone used in Brewster & Co.'s for this purpose, is, first, a prepared stone or brick, marked "Schumachersche Fabrik" (showing it to be of German make), and the grade—there are several—is No. 3. II. This cuts rapidly, and the surface is then finished with lump pumice-stone. When the rubbing is finished, wash the body clean, and dry off with a shammy, then set it aside for at least eight hours, for the moisture to evaporate.

This "drying out" of the body is of vital importance, and should not be neglected. Rough-stuff, providing it is *good rubbing* rough-stuff, is necessarily *porous*, no matter what pigment or vehicle is used, and the water used in rubbing is consequently absorbed by it; therefore, it is essential, after the moisture has all evaporated, that the pores be closed, in order that the oil of subsequent coats may not be absorbed by them.

The reader will notice that our aim, throughout the foundation painting, is to produce a non-absorptive surface. The P.W.F. closed the pores of the wood against moisture, then it became necessary to *level* the surface for the color-and-

TUNE—"*Peter Piper picked a peck of pickled peppers.*"

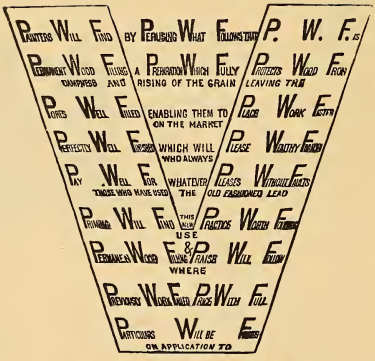
PETER PINXETUS, the philosophical Painter,
In painting a Phaeton for a particular patron,
Pronounced his plain purpose to prime with paint patent. (P. W. F.)

Plenty of Painters—professors of painting
Protested, protested — predicted poor painting,
Proclaimed it "played!" plainly—
Preposterous proposal! to prime with paint patent!
Presumptuous Peter! poor pill of a Painter!
Poor priming! poor pastime!
Placid, persistent,—yet patient, progressive,
Proud Peter pushed forward, primed, puttied and painted.

Presto! Persimmons! the Phaeton's painted!
The patron, well pleaséd, the painter much praiséd;
The Painters pretend they were plainly prophetic,
Proclaim it pre-eminent! pronounce it perfection!
Poor Painters! Poor Painters!
Who prefer "played-out" priming,
Who pretend to pursue the path of true progress,
Yet persist in the past and prefer not "wood-filling."

WHAT IS

P. W. F.?


PAINTERS WILL FIND BY PERUSING WHAT FOLLOWS THAT P. W. F. IS
PERMANENT WOOD FILLING AND VARNISH
A PREPARATION WHICH FULLY RISING OF THE GRAIN
PAINTERS WOOD FROM LEAVING THE
PORES WELL FILLED
ENABLING THEM TO ON THE MARKET
PLACE WORK BOTH
PERFECTLY WELL FINISHED
WHICH WILL WHO ALWAYS
PLEASE WORTHY TRADE
PAY WELL FOR THOSE WHO HAVE USED
WHATEVER THE
PLEASES WITHOUT OLD FASHIONED LEAD
PAINTING WILL FIND THIS NEW USE
PRACTICE WORTH TRYING
PERMANENT WOOD FILLING & VARNISH
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VALENTINE & COMPANY

VARNISH MAKERS

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varnish, and our only means of doing this was by the use of a porous material called rough-stuff. Now, if we should mix this rough-stuff with sufficient oil or varnish to make it anti-porous, we would be unable to rub it to a smooth surface; so, to carry out our plan, we have to coat the rubbed rough-stuff surface with P.W.F., and we do this in the same manner as if priming, excepting that no sand-paper is used. This will effectually close the pores of the rough-stuff, and at the same time securely bind or cement the paint into a homogeneous mass, giving us a marble-like surface on which to spread the color.

We know that mud, if left on a varnished surface, will extract by capillary attraction a portion of the oil from the varnish, and destroy its brilliancy. Just so will the porous rough-stuff, under the varnish, drink in the oil from the under side, and destroy it; but, thanks to Mr. Fred. J. Greene, of Boston, who first suggested the use of P.W.F. over rough-stuff, we are now able to avoid this trouble.

The coating of P.W.F. over the rough-stuff must be allowed at least 48 hours to dry, or otherwise there will be danger of cracking in the color coats. When this time has been given, we may dust off and apply a "preparation" or "ground" coat, but in no case should the rough-stuff surface be rubbed or otherwise disturbed before the application of the color coat.

This body we will paint black, as that is an easy color to mix and apply.

For the ground coat, mix lampblack with Crown Coach Japan, or Japan Gold Size (remember that the latter is twice as strong as Japan, and that consequently only half the quantity will be required); thin with turpentine and run through the mill. When ground, add a tablespoonful of raw oil to each pint of paint, and stir well. Then, to test whether the proportions are correct, spread a thin layer upon the thumb-nail, blow the breath upon it to hasten evaporation, and in a moment it will assume the same appearance it would have when dry upon the body. If too "dead" or "flat," add a very little more oil; if too glossy, a little turpentine will help to bring it to the desired "egg-shell gloss," and when this is obtained it is ready for laying on. This method of testing paint for color on carriages is the most reliable one to secure a uniform degree of elasticity. Owing to the peculiarities of pigments, some being natural driers or neutralizers of oil, and others anti-drying, no arbitrary rules can be laid down which will give satisfaction, but almost all colors may be tested in the above-named way.

It is our aim to get on just as small a quantity of paint as possible in covering or making a solid ground, and we therefore use flat camel's-hair brushes, or, as known by some, "mottlers" and "blenders." When the ground coat of lampblack has been on 24 hours, we may go carefully over the job, and putty

any little scratches or imperfections found thereon; and, when dry, a very light rub with fine sand-paper will prepare it for the *color proper—i. e.*, ivory black.

The introduction of ready prepared colors into the carriage paint-shop has been a blessing to the painter, and we recommend their use in this connection. Valentine's Ivory Black, for our color, will require a very little turpentine to bring it to a smooth working consistency, with the addition of a few drops of oil, to bring about a subdued gloss, tested by the thumb-nail method. One coat of this, laid on with a clean camel's-hair brush, will complete the coloring process.

One day is sufficient for drying the color, after which we come to another *important point* in our journey toward completion, namely, the application, on all black surfaces, of Valentine's Black Japan in the place of the old-fashioned mixture, "color-and-varnish." English Black Japan has been in use in England and France for many years, but its use in this country is comparatively new. It produces a superior shade of black, and is in every respect a more durable and brilliant coating than the ordinary black color-and-varnish. Valentine & Company have produced a Black Japan superior to the English article, in that it may be mixed or diluted with any of Valentine's Varnishes without discoloring (turning green), whereby a gradual increase in elasticity from the color outward can be secured, giving at the same time increased durability.

This feature of the admixture of the varnishes used in the carriage-shop is of more importance than is usually supposed. However, a certain amount of judgment must be exercised in mixing them. Valentine's different varnishes will readily assimilate when mixed, which cannot be said of all others, and by this means the time in which they will dry may be graduated; for instance, a job is promised to be done at a certain time, but it so happens that the few days left in which to finish it are rainy or bad drying ones, and the Wearing Body or Elastic Gear Varnish cannot be made to dry in time. We may add to either a little Hard-drying Body, or a little Quick Leveling, without perceptible detriment, and bring about the drying within the time allowed. To Black Japan either of these varnishes may be added to make it work freer, or to add durability; this is the result of using the same grade of oil in manufacturing all the articles.

If the painter uses the goods of several different manufacturers, he cannot put the same dependence on his work, for he knows not which is adulterated with fish or cotton-seed oil, nor what degree of assimilation or "grasping" there will be between the coats; while with a pure and uniform oil, judiciously mixed throughout, from the foundation to the finish, he may rest assured of success, and be enabled to locate any difficulty he may experience, and remedy it in the future.

The body being dusted off nicely, we now apply a medium heavy coat of Black Japan, using for the purpose bristle varnish-brushes, and working the japan—or "dressing it," as some term it—no more than is necessary to have it lay or flow level. It sets quickly, and the painter will no doubt find it rather difficult to work it easily at first; but when it is understood, and the knack of putting it on acquired, a return to the use of black color-and-varnish will not be liable.

As said before, it produces a jet black color, far ahead of ivory black, and rubs nicely for varnishing over. In "touching up" any "rubbed through" places, it is only necessary to first color with quick black, and then to glaze over the place with ordinary asphaltum thinned with turpentine, to produce the jet black color of the japan. We often hear the remark, "I don't see how those New-York fellows make their work look so nicely;" one-half the secret lies in the use of Black Japan on the black portions of the work; and it is this intense blackness that "brings out" the beauties of the other colors in juxtaposition to it. A lake or green will be improved if placed beside jet black, and many give credit to superior quality of pigments, when in some cases a poor one may have been used, but the appearance of the *color* was heightened and improved by its surroundings.

The first coat of Black Japan should be allowed at least three days for drying, when it will be found to rub easily for the second coat.

The second coat may be diluted with a small quantity of Valentine's Hard-drying Body Varnish, and three or four days given for drying.

The third and last coat of Black Japan may have from 10 to 15 per cent. of Hard-drying Body Varnish added, and then, as it is time for the trimmer to put in the linings, the job can conveniently stand a week to harden before the final rubbing or finishing coat of varnish is put on. It will be seen that no *clear rubbing* varnish is used, and thus the color is not "*greened.*"

After a thorough rubbing and washing, a coat of Valentine's Wearing Body Varnish is added, and this completes the painting of the carriage body.

HOW TO PAINT A CARRIAGE GEARING.

The wheels, beds, bars, etc., should be coated over with Permanent Wood Filling as soon as finished, before the grain of the wood is raised by the dampness of the air; then wipe off as dry as possible with clean rags, and they are ready for the smith-shop.

The P.W.F. in this case acts as a preventive coat, and protects the wood from blacksmith's oil, dirt and water, or from springing or warping by heat, cold and moisture.

When the gears come from the smith-shop, take No. 3 sand-paper, and cut down every part until nothing but clean wood and iron appear. The "preventive coat" has done its duty, and the job is ready for painting.

Now apply a medium heavy coat of P.W.F., "daubing it on roughly" over wood and iron alike, then proceed to wipe off with rags, being careful not to leave any P.W.F. on the surface, around the ends of spokes, etc. Run the job one side to dry, and give it 48 hours.

Next putty up all imperfections, and open-grain places, but do not put on any more putty than you can help. Give until next day for drying, then smooth down nicely with 1½ sand-paper. Dust off clean, and apply a light coat of P.W.F. in the same manner as before. This closes the pores of the putty, and forms a film over those portions cut through by the sand-paper.

Let all dry until next day, or, if there is plenty of time, give more; then, without disturbing the surface, lay on an elastic coat of color.

The first coat of color should have more oil in its mixture by 5 per cent. than is necessary to produce an egg-shell gloss. Give 48 hours for drying, then go lightly over with worn sand-paper, and smooth down; putty any missed places, dust off, and lay on a coat of color proper.

In all coatings of paint, use a camel's-hair brush, and apply no more paint than is sufficient to cover the ground.

Next day, dust off and apply a coat of color-and-varnish, laying it on quite heavily with good bristle varnish-brushes. This color-and-varnish may be made by grinding the dry pigment in Hard-drying Body Varnish. If the job is painted black, Valentine's Black Color-and-Varnish may be used. Give from two to three days for drying.

It will now be found that the job will look as if it would be a poor job when finished, from the fact that the grain of the wood is perceptible on many parts. But patience! We have closed the pores of the wood against moisture; we have smoothed it down and colored it, but have not up to this time made a glass-like surface, as in the old-fashioned way of painting. We *desire to fill up the open grain with varnish, gum and oxidized oil*, rather than with a dry porous pigment, for the gum will be elastic, and the severe strains to which the wood of a gear will be subjected will in no wise disturb the mirror-like surface we aim to produce.

Now rub over every part with curled hair, or, what is better, give it a light rub with pumice-stone and water, and apply a second *flowing* coat of the same color-and-varnish. Give three or four days to dry, then rub down gently with pumice-stone, and stripe. When the striping is dry, lay on a coat of Hard-drying Body Varnish, give all the time possible to harden, then rub and finish with a flowing coat of Valentine's Elastic Gear Varnish; or if extra durability is desired, use instead, Wearing Body Varnish.

HOW TO PAINT SLEIGHS.

When the woodwork is completed, dust off and apply P.W.F. to all parts with an ordinary paint-brush; then begin the "wiping off process" with some clean rags (sixpenny muslin torn into small pieces is best); rub over and wipe off every part of the work until the hand can be passed over the surface without soiling it, bearing in mind that the better the P.W.F. is wiped off, the quicker it will dry, or become fit for a coat of paint. Give the job twenty-four hours for drying, either in a warm room or in the sun; then apply a coat of Valentine's Ground Rough-stuff.* When dry, putty up all nail and screw holes, and apply a second coat of rough-stuff having but little oil in it. Next rub down; in the mean time the benches, knees and runners have been puttied over the P.W.F., and are ready for sand-papering off, to receive color at the same time that the body is under way. The foundation is now laid, and two coats of color should be sufficient to make a good job. Now give a coat of color-and-varnish, moss off and stripe, then finish with a flowing coat of Valentine's Medium Drying Varnish.

If a durable job is desired, the surface of the body, after being rough-stuffed and rubbed, should be coated with P.W.F., and wiped off the same as directed for carriage bodies, but in cheap work this may be dispensed with.

HOW TO PAINT CHEAP WORK OR WAGONS.

In the case of cheap work or business wagons, first put the P.W.F. over the wood in the same manner as before directed. Then wipe off well, and send the work to the smith-shop. When ironed, the P.W.F. will be quite dry. Next

* Home-made Rough-stuff of English Filling, or Reno's Umber, *may* be used if a good share of oil be used in the mixture for first coat. The advantages of Valentine's Prepared Rough-stuff are expressed on page 5.

lightly rub over the wood with fine sand-paper; putty up all openings smoothly, and apply a very light coat of P.W.F. over all, wood and iron alike. Give twenty-four hours for drying. Next apply the color, say green on body panels, and vermilion on gears. One coat may suffice; then apply two coats of color-and-varnish, rubbing lightly after each coat. When dry, stripe and letter, and finish as ordinarily.

REPAIR WORK may be done in a similar manner, and this method, besides allowing a saving in time and material, makes a more durable job than the process where lead color is used as a priming.

ON HURRIED WORK, such as repairs to a wheel, apply P.W.F., wipe off well, knife over the parts with soft putty, smooth down with the *back* of a piece of sand-paper, and immediately lay on color and varnish, made strong enough with color to cover. When dry, moss off and apply the finishing coat of varnish.

NEVER BE AFRAID of trouble from the use of P.W.F. *when it is well wiped from the surface*, and judgment is used in the application of the next coat, in *not applying quick-drying color.*

GENERAL SYNOPSIS OF THE AMERICAN METHOD FOR CARRIAGE BODY.

1st day,	Apply P.W.F., and wipe off,	For drying, give	48 hours
3d "	First coat of rough-stuff, a little oily,	"	48 "
5th "	2d " " ordinary,	"	24 "
6th "	3d " " "	"	24 "
7th "	4th " " "	"	24 "
8th "	Stain coat over rough-stuff,	"	24 "
9th "	Rub down with pumice-stone.		
10th "	P.W.F. rubbed over and well wiped off,	"	48 "
12th "	1st coat of color or lampblack,	"	24 "
13th "	2d " " ivory black,	"	24 "
14th "	1st coat of color-and-varnish or Black Japan,	"	48 "
16th "	2d " " " "	"	48 "
18th "	3d " " " "	"	48 "
20th "	Finishing coat of Wearing Body Varnish.		

If an extra durable job is desired, give the Wearing Body Varnish *one week* to harden; then lightly rub and apply a second coat of the same Varnish, being careful to apply the varnish immediately after rubbing, and before the surface has had time to sweat.

FOR CARRIAGE GEARING.

1st day,	P.W.F. put on the completed gear, and wipe off,	give 48 hours.
3d "	Putty up all open-grained places, . . .	" 24 "
4th "	Sand-paper, putty, and put on P.W.F. again, .	" 48 "
6th "	Apply color or lampblack, ...	" 24 "
7th "	Apply color-and-varnish quite strong, . .	" 48 "
9th "	Rub and give second coat of color-and-varnish, .	" 48 "
11th "	Rub down, stripe, and ornament, . . .	" 24 "
12th "	Give coat of rubbing varnish, ...	" 48 "
14th "	Finish with Elastic Gear Varnish.	

The above time is given as the minimum or shortest possible time to do a first-class job, but as the painter will generally have more time to spare upon the job, he may divide it, giving the extra time for the P.W.F. and the varnish coats to harden.

FOR SLEIGHS.

1st day,	Coat P.W.F. all over, ...	give 24 hours, if well wiped.
2d "	1st coat rough-stuff, ...	give 48 hours.
4th "	2d " " ordinary, ...	" 24 "
5th "	Rub body, sand-paper runners, and putty same.	
6th "	Color all over, ...	" 6 "
6th "	2d coat of color all over, ...	" 18 "
7th "	Color and varnish all over, ...	" 24 "
8th "	Stripe and ornament.	
9th "	Rubbing varnish all over, ...	" 24 "
10th "	Finish with Medium Drying Varnish.	

This, kind reader, brings us to the end of our journey through the New-York carriage paint-shop, and ere we part company let us say that, in return for your patience in giving us a hearing, as we have rambled through the Body and Gear Rooms, we promise to give you any further information on the subject that we are possessed of, should you ever feel disposed to ask it. We would also take pleasure in opening, and in keeping open, a correspondence with you relative to our art, to the end that we may be of mutual service to one another, and that the bonds which hold us in the fraternity may thereby be more firmly cemented. Prompt replies to all such inquiries will be made public through *The Hub*, in the department known as "Valentine's Letter Box."

Yours truly,

FRANKLIN B. GARDNER,

Formerly Superintendent of the Painting Department in Brewster & Co.'s (of Broome Street) New-York Carriage Factory.

The Deviltries of Varnish.

PREFACE.

PROBABLY no essay on the subject of painting or varnishing was ever so widely distributed as the following, entitled "The Deviltries of Varnish."

Its history is as follows: It was originally written by Mr. Geo. W. W. Houghton, Editor of *The Hub*, as a review of sixteen essays that had been received by that magazine in response to a prize offer of $300. This review was first published in the *Painters' Magazine*, New-York (1876), and perhaps 2,000 copies sent out. It was next reprinted in *The Hub* (1876), and 3,500 sent out. The present publishers then took it in hand, and printed 10,000 copies in book form; it was also translated, and 5,000 copies of a French, and 2,500 copies of a German edition were published. The *Paint and Oil Review* and other periodicals have reprinted it in full.

It presents, in a brief and readable form, the latest facts and theories regarding the conditions under which varnish is liable to give trouble to the workman, and suggests means of curing such misdemeanors or "deviltries," and of avoiding their recurrence.

In preparing for press this, the fourth edition of the essay in book form, Mr. Houghton has carefully revised it, making numerous corrections and additions which seemed necessary to bring it up to date. Those who are fully conversant with the facts contained in previous editions will therefore do well to read this with equal attention.

The publishers will be pleased at any time to receive further facts regarding the points discussed, from any of its readers who find reason to differ in opinion, or who have further facts to offer.

THE DEVILTRIES OF VARNISH;

THEIR CAUSE, REMEDY AND PREVENTION.

IN a previous review (see Vol. XVIII. of *The Hub*, pages 388, 430 and 470), the writer has described, at length, the various troubles which the painter encounters in connection with the use of Colors, and offered practical suggestions as to the precautions that should be taken to avoid them. The following is a similar review of the difficulties attending the use of Varnish, most of the facts presented being collated from a series of sixteen prize essays on this subject, which were written by as many practical carriage and car painters, English as well as American.

These writers mention *fifty-five* (55) *technical names for varnish misdemeanors* (one writer enumerates 21); but we discover from the context that many of these are but *aliases* for the same trouble, and we have thus been able to reduce the total to *twelve which may be considered as typical.* These again might be reduced to three sub-classes: (1) those due to poor materials; (2) those due to unskilled or careless workmanship; and (3) those due to unforeseen and accidental agencies of the weather or atmosphere. The line of demarkation between these causes would not always be clearly defined, and we will therefore adopt the simpler method of introducing the troubles in the order wherein they would naturally present themselves to the workman.

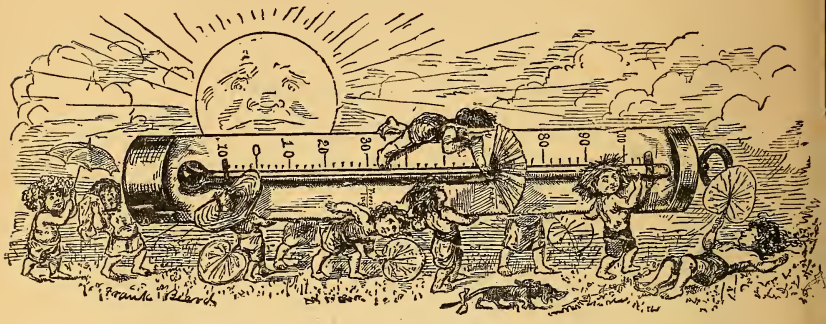
1. GOING "SANDY," "SEEDY," OR "SPECKY," INCLUDING REMARKS UPON "CHILLING."

Definition.—These terms are applied when the varnished surface appears as if fine sand or seed had been sprinkled over it.

Causes.—Looking first to the varnish itself, we find that a newly made varnish, which has not had sufficient time to ripen, is liable to make work look "seedy," but an experienced workman will generally be able to detect, by its working, that it is not in condition to use; if set away in a warm place and allowed to mature, this trouble will in a few months be corrected. To use varnish from a freshly-opened can, without first uncorking it and allowing fifteen minutes' exposure to the air, that the "spirit of varnish," as it is called, may evaporate, will sometimes cause a specky finish. "Chilling" of varnish, liable to occur during cold weather, is one of the most common causes of a sandy surface. One of the sixteen essay writers, already referred to, says:

"In cold weather, after you have varnished your job, and after it has become set, you will sometimes observe it to be full of specks, and as it dries, these will become more apparent, presenting the appearance as if some person had taken a pepper-box, and given it a good peppering. This is caused by the oil in the varnish, in connection with the dryers with it is made, becoming chilled."

"Chilling" may readily be avoided by having a warm varnish-room, and by storing the varnish in a warm place, or, where this is not convenient, by setting the can near the stove for an hour or so, previous to varnishing.



"Why don't you send for one of our Thermometers?"

"Chilling," and consequent "sandiness," may also be caused by exposure of varnish to extreme cold during shipment, or by long storage in a damp or exposed place. This will affect its working, or, in more severe cases, the particles of dryer may be crystallized from the state of solution, and fill the varnish with specks, which are often incorrectly thought by painters to be particles of uncut gum. Exposure to warmth will generally remove this evil, and a varnish that is "specky" in February may nearly always be cured of the fault by setting it away in a warm place until May or June.

Next remember that all varnishes deposit more or less settlings when left standing for a long time, and, for this reason, when seven-eighths part of a can of *finishing* varnish has been used, the remainder should be set away for less particular purposes. Varnishes improve by age up to a certain point, after which they become fatty—often too fatty to use—but they never become seedy or sandy by reason of age.

Specks are also liable when varnish is allowed to skin over. Some varnish will skin over although the stopper is kept constantly in the can, and this skin being broken and mixing with the varnish, will cause it to look sandy or seedy.

Three other common causes of specky work may be mentioned, namely: (1) dirt upon the job, as pumice powder; (2) dust present in the air, particularly liable in loosely-built shops during windy weather; and (3) specks or "lice" in the varnish-brush, due to a variety of causes, which every experienced painter ought to understand. These few hints may be valuable in this connection: have solder run into the rivets in the tin of your brushes, and smoothed off; turpentine or oil in the brush will sometimes produce specks; or if turpentine be used to thin the varnish, the same result may follow.

2. "SWEATING."

Definition.—"Sweating" is the technical term applied to a greasy gloss which often makes its appearance upon a varnished surface, after it has been rubbed and allowed to stand for some time.

Causes.—This so-called "sweating" is the reappearance of the gloss of the varnish after it has been removed by rubbing. It shows that the varnish is not thoroughly hard, and in the hands of an inexperienced workman it may lead to serious results if varnished over, causing pitting, icicling, or a variety of other troubles; one writer has recorded the following:

"The sweating of rubbing varnish is a common occurrence, taking place after the varnish has been rubbed with powdered pumice, over which, if the painter is inexperienced, he may immediately varnish, and he is quite astonished at the rough appearance of the coat, which he has just applied over what he thought was a nice, smooth surface, and he exclaims: 'That varnish is not worth a cuss; it's all sagged-in; it's all enameled!' Another says it's 'punky;' another that it's 'gone livery,' or 'crinkled up,' or 'like corduroy.'"

Prevention.—Bear in mind that varnish is always liable to sweat if placed over color or varnish that is not thoroughly dry. If, over a carefully prepared ground, it still does so, the varnish is perhaps at fault; but do not too hastily condemn the varnish, for it may merely require more time to harden. Remember that, as the proportion of oil is increased, so is the liability of the varnish to "sweat," and the most durable varnishes are therefore most liable to give trouble in this respect. Several painters have enlarged upon this fact, one of them remarking:

"In consequence of not rubbing finishing varnish, sweating does not make its appearance; however, if finishing varnish should be rubbed in a week or two after the job was varnished, it would sweat, and sweat badly."

Now, it is not the sweating that we are concerned about, but the various deviltries liable to show themselves as soon as a subsequent coat is applied. How shall we remedy these?

Capt. M. O'Connell, of this city, gives in the following a few simple directions, which, if carefully observed, will obviate all danger. He says:

"As a precaution, in case of a job liable to sweat, allow it to stand four or five hours, if in summer, or over night if in winter, after being rubbed, by which time the sweat will make its appearance. After it does this, allow it to stand just as long as you can before varnishing, and rub the sweat off with fine pumice or an old pumice-rag, else you will have trouble if you finish too soon, as your finishing coat may have a specky appearance all over, or fine brush-marks will show themselves."

Let us add, that varnish should ordinarily be applied as soon after rubbing the previous coat as possible.

3. "RUNNING," "SAGGING," "CRAWLING," ETC.

Definitions.—"Running" or "sagging" are terms applied to an uneven surface of varnish, produced by its flowing down. These two are generally due to unskillful handling of the varnish. "Crawling," allied to the above, may be caused by varnishing over an oily, glossy surface, or over a sweaty coat of varnish; this is not likely to be the fault of the painter. Crawling may be prevented by washing the work before varnishing, or by rubbing with curled hair or a damp shammy. In revarnishing a job which, to all appearances,

was finished with English varnish, it is generally best to first rub the surface well and apply a thin coat of rubbing varnish; then, when dry, give a light rub, and with these precautions, the finishing coat of high-grade varnish will not crawl or blotch. Crawling may also be caused by touching the work with perspiring hands, in which case it will occur more particularly on the frames, which are most handled; previous to finishing, every job should for this reason be cleaned by rubbing with pulverized pumice or rotten-stone (the latter is preferable, being finer), which will remove this source of trouble. Varnish is also liable to crawl or draw when applied to work that is cold, or when applied in a room that is cold or damp.

"Crinkling up" or "wrinkling" must in some instances be attributed to varnish that is too new, and therefore in buying varnish, especially for finishing, preference should be given to that which is well ripened. One painter remarks, as the result of his experience:

"To produce best results in finishing work, I think the varnish should be at least a year old, and varnish of that age will save the finisher much annoyance, as he will not be so liable to have his work crinkle or pucker up. When this does occur, these crinkles should be partly cut away, and faced down with lump pumice and a little oil or water; and then revarnished. or touched up and varnished."

Inexperienced workmanship is also a frequent cause of puckers or crinkles in finishing varnish, the painter not having brushed the varnish equally all over, and consequently leaving more varnish in one place than another; and when this occurs, the excess of varnish must crinkle up, for obvious reasons.

"Curtaining" indicates the running or sagging down of the varnish, particularly about moldings, ornaments, etc., in forms resembling curtains or festoons; this trouble is sometimes spoken of as "festooning." The cause may in some instances be the use of varnish that is too new, but "running" and "curtaining" are generally the faults of application, sometimes by reason of using a brush that is too soft and inelastic, whereby, being spread unevenly over the panels, the varnish is left thick in some places and thin in others, and will overlap and run, particularly around corners and edges. Such runs about the edges of moldings are commonly termed by painters—with greater force than elegance—"snots." The brush should be elastic to work the varnish well over the panels, and the coat should be laid as expeditiously as possible, to avoid setting or thickening of the varnish before it has been spread evenly. A slow-drying and durable varnish, containing a large proportion of oil, is more liable to run and streak than one which is harder-drying and heavier in body, and for this reason the highest grades of varnish require most brushing up, or "dressing," as it is termed. A *thin, limpid varnish*, well dressed by an experienced workman, will always *flow out best*, and make the *most brilliant surface.*

The theory of "wrinkling" is well explained by one painter as follows:

"Wrinkling is caused by a too heavy flow of varnish; the outside surface absorbs oxygen, and, drying, forms a skin over the larger mass of varnish; this, in turn, gives up a portion of its volatile oils, which lessens its bulk, and the outside skin, thereby becoming larger than necessary to cover the under mass, draws up in ridges or wrinkles, somewhat resembling the wrinkling of the skin in old age."

"Going silky" or "enameling," applied to a varnished surface presenting a fibrous or textile appearance, as of silk or enameled leather, is another trou-

ble that painters frequently meet with; but one writer expresses his conviction that "none are annoyed by it except those who work or finish in a poorly heated room, in which case you can hardly give your varnish sufficient brushing to keep it in its place ere it commences to silk." Of course, the colder your room, the less time you have to dress your varnish, and the less opportunity to insure a level surface. The temperature of a varnish-room should range between 70 and 80 degrees Fah., and should be kept as uniform as possible, not only while varnishing, but during the processes of setting and drying. Varnish is also liable to "go silky" when the under coats are not well dried. Mr. F. B. Gardner relates the following case of "silking," which occurred during his early experience in Tarrytown, N. Y., which clearly points out the effect and cause in one instance:

"I have had varnish become 'silky' on one side of a body, while the other parts remained in good condition; and, by following it up, I found the cause to be a current of cold air, passing between the body and the side of the room, from a crack between the base and the floor; and when this was caulked tight, I never saw another case of 'going silky' or 'enameling' in that varnish-room. This may not be the only cause, but it is well to know that it is one of the causes, and it is therefore best to have bodies raised at least thirty inches from the floor, to secure the varnish panels from draughts of cold air, which, if they exist at all, commonly lurk near the floor."

The admixture of turpentine with varnish is also a common cause of "silking;" and brush-marks, the result of working the varnish too long, often leave an effect similar in appearance.

The next two terms will probably be new to American readers, but they deserve a place and full description in this category.

"Syssing" is a term used by English carriage painters, being synonymous with "crawling," as used in America, but applied more particularly to this trouble in connection with repair-work, and under certain conditions which will be described. Mr. Charles S. Middleton, the London correspondent of *The Hub*, gives the following instructive account of this evil, and the method employed in English paint-shops to avoid it:

"'Syssing' is one of those evils that occur in jobbing work. It is a common plan for an English painter, when a job is brought to him for varnishing only, to give it a thin coating, first of a mixture consisting of *gold-size, varnish and turpentine*, made up as wanted to dry.* The object of this is to kill any grease that may be hanging around it, and the effects of sweating. Without this intermediate coating, the varnish will be liable to run in lumps, which is called 'syssing,' and of course the job will be spoiled, there being no remedy but to rub off the varnish, and varnish again properly. The painter may save himself the trouble of flatting over this mixture, by putting about two tablespoonfuls of turpentine into a pail of water and washing off with this, which will enable him to lay his varnish on all right. But varnish will also 'syss' on new work if it be laid on without previous flatting, or on a ground imperfectly flatted; or if the ground be flatted one day and varnished the next, without giving it another rub over, the oil of the color being likely, in the mean time, to rise to the surface."

"Icicling."—Mr. Wm. J. Fraser, a practical painter of Rochester, N. Y., first introduced the term of "icicling," and he gives below a detailed description of a variety of "runs" to which he appropriately applies this descriptive term, caused by the "sweating" of little nibs that have been rubbed out of the rubbing coat, leaving softer varnish beneath. He says:

"'Icicling' may seem a strange name to call any thing connected with painting, but it is the only thing I can liken this evil to, as it resembles a myriad little icicles all over the job. I have met several who declare them to be runs from nibs or lumps, but this is a mistake, as there is a clear difference in their appearance, and an observing eye will find that the following is the true cause of this evil. When the last coat of rubbing varnish is rubbed, not being

* It would hardly be proper to put in print the English term for this mixture; it has been used to some extent by coach-painters in this country under the name of "cider."

thoroughly hard, the nibs or lumps immediately commence to sweat out or gloss; and when the work is finished in this condition, every one of these little nibs will produce upon the surface of the subsequent coat an elongated drop resembling an icicle. To avoid this, no job should be finished on the same day it is rubbed, though it may be finished on the next day, if required; but never omit using the pulverized rotten-stone, water and cloth before varnishing, which is a never-failing remedy for 'icicling.'"

4. "PIN-HOLING," "PITTING," "BLOTCHING," ETC.

Definitions.—These three terms denote relative degrees or stages of the same general deviltry, and their appearance may be defined as follows:

Pin-holing.—This term is applied to the condition of a varnished panel showing a surface disfigured by innumerable small indentations, resembling pin-holes.

Pitting.—The same as pin-holing, but with the indentations more strongly marked.

Blotching, or Pock-marking.—Still more marked, presenting the appearance of very large scars, as of pock-marks on a person's face.

Causes.—Mr. J. C. Shettsline, master-painter in the Union Passenger Railway Shops, Philadelphia, offers the most comprehensive list of influences which are liable to induce this class of deviltries. He says:

"The defects known as pitting, pin-holing, curdling, wrinkling, enameling, drawing up, and going stringy, are mainly due to the same general causes, namely: 1. Change in the atmosphere from dry to damp; 2. Mixing two kinds of varnish of different grades or different makers; 3. Excessive heat or cold; 4. Varnishing over color or varnish which has not become sufficiently dry; or, 5, which is sweaty; 6. Varnishing with the floor very wet, or damp and cold from other causes; 7. Placing cold or damp varnish on warm panels, or *vice versa* (by 'damp varnish' I mean varnish that has been kept in a cellar or other damp or cold place); and 8, another common cause is the lack of proper ventilation, and of maintaining a uniform temperature."

Another writer adds his theory in regard to "Cause No. 1," as enumerated by Mr. Shettsline, saying:

"A sudden fall of temperature in summer will cause the pin-holing or pitting of varnish, especially if the varnish-room is saturated with water, which, being evaporated by the excessive heat of the varnish-room, is held in suspension by the air, and then let loose in the form of minute drops of rain upon the varnish while still wet; when the temperature falls rapidly, as it does at times, during the summer months, these little drops being heavier than their own bulk of varnish, sink, and the varnish retreats from them, causing the pits."

In such a case, a fire should at once be made in the varnish-room stove to evaporate these minute drops of water; if this is not done, the work must be rubbed with ground pumice, and revarnished, and it often requires two coats of rubbing varnish to fill up the pin-holes. In summer-time throwing up all the windows will sometimes stop "pitting." In the opinion of Mr. G. C. Cornell, of Quincy, Ill., "pin-holing" and "pitting" are generally caused by oil present in the brushes, owing to their not being carefully wiped out when taken from the keeper. Let us note here that varnish-brushes ought never to be kept in oil, but in the grade of varnish which they are used to apply. Several painters give a warning in regard to brushes. One says:

"Blotching may be occasioned by 'preparing' the varnish, or by presence of turpentine in the varnish-brush; and if a painter kept his brush in a mixture of turpentine and oil, he might confidently expect to see his panels 'blotched' when varnished."

Mr. F. B. Gardner, in his prize article upon the "Care of Varnish-Brushes," makes this excellent remark: "Varnish, as a general rule, is *delicate in its choice of company.* A little turpentine, a little oil, or a little of any thing, except its own kind, will make it liable to pit or crawl, or flake, or cut up up some caper, and *that dangerous little* is frequently supplied

CALENDAR FOR 1879.

JANUARY....Begin the use of the American Method, if you have not already done so.

FEBRUARY...Look out for currents of cold in the varnish-room.

MARCH.....Dust is effectually prevented from settling on work by the use of a good ventilator.

APRIL.....Don't take down stoves yet; the nights are cold, and varnish is tender.

MAY....."*Sweating*" *may occur during this month; to prevent it, varnish as soon as rubbed.*

JUNE.....Look out for flies; see page 36. Keep varnish-room as dark as possible.

JULY
AUGUST } *...Mud-spotting is liable to occur; see p. 34.*

SEPTEMBER..Prepare heating arrangements for varnish-room.

OCTOBER.....Keep up heat in varnish-room to 75 degrees, by the use of steam, gas-stove, or base-burner.

NOVEMBER...Revarnish the sleigh stock on hand.

DECEMBER...Look out for specky varnish; see page 19.

by putting into the varnish-cup a brush fresh from a bath of another liquid, as of oil."

The presence of sugar-of-lead as a drier, in the color-coats beneath the varnish, is also thought to be an occasional cause of "pitting," and instances are detailed in one of the manuscripts before us. The best way to avoid this source of trouble is to avoid the use of sugar-of-lead, substituting Japan Gold-Size. One writer says:

"When sugar-of-lead is used as a drier, it should be ground exceedingly fine. Our painters use it with lakes because it does not affect their color, but, for fear of causing pitting, they take care not to use it in their glaze color, or, more correctly speaking, in their varnish color. If they use it in the oil color preceding the varnish color, they take care to thoroughly cleanse both pot and brush, if they do not use another pot and another brush, before proceeding with the varnish color coats."

Japan Gold-Size, however, would still be preferable. A fourth writer adds the following facts in this same connection:

"'Pitting'—or something very similar in effect—may be occasioned by using varnish too new, because the driers used in its manufacture are for a long time held in suspension, and their presence may produce these troubles. The same characteristics will be exhibited if the painter uses up his varnish too close to the bottom of the can, owing to the settling of driers."

We have already mentioned that the dregs of a can of finishing varnish ought always to be laid aside for common work.

Finally, Capt. O'Connell, of New-York, relates the following two instances of "pitting" which occurred during his experience, and which the reader will find interesting and suggestive. First example:

"I once heard a workman venting his indignation against some varnish which had always worked well before, but now it would shame small-pox. The trouble was this: it was a windy day, the shop very insecure, and he had deluged with water the floor of his varnish-room, which was heated to about 90 degrees Fahrenheit. Evaporation filled the air with moisture, which, with the overheat, caused the difficulty."

Second example:

"I once placed some bodies, just finished with English varnish, with the back panels downward, and the body-loops resting on the floor, which had been wet down, for safety from dust. Next morning they were a pitiable sight; beginning near the centre of the body, which was about two feet from the floor, the pock-marks increased in depth and frequency to the part nearest the floor, where it was a *complete blotch*, while above the centre the varnish was not disturbed. The cause was plain: cold and dampness at the bottom, dryness and warmth above."

And the same writer adds:

"A dry, warm atmosphere is the best safeguard against many of the ills that beset the varnish-room, pitting included."

We will now turn to a class of varnish troubles which are due more particularly to lack of care on the part of the painter, rather than to the materials used.

5. "DEADENING," OR "SINKING-IN."

Definition.—"Deadening," "going in," "sinking in," "perishing," "withering," "grain showing," "sadding down," or "saddening," "striking in," and "going sleepy" (the latter an English expression)—these are a few of the many terms applied to one serious deviltry on the part of varnish, in which it loses its brilliant looking-glass surface, and becomes dull and lustreless.

One writer, taking a rather gloomy looking view of the situation, expresses his conviction that "*at least thirty per cent.* of all the carriage work done in

the United States results in 'sinking-in.'" He must have had pretty hard luck, we fear, in his individual experience. There can be no doubt, however, that the trouble is exceedingly common, and that it puzzles even the best painters to avoid it on all occasions. Another writer endeavors to picture a more cheerful aspect of the case, by arguing at some length that the durability of varnish is not necessarily affected by its deadening, and he adds:

"The durability of a varnish is not lessened by lack of lustre, as the fault may all lie in the manufacture, not in the materials used, but in proper proportions."

This hardly lessens the difficulty, however; and we cannot agree with him in thinking that faulty manufacture is the common cause of this trouble; indeed, our observation leads us to believe it is very seldom the cause, but that the painter is nearly always to blame for this misdemeanor. We will now go on to explain the usual conditions under which deadening occurs, allowing a practical painter to illustrate each in his own words.

Common Causes.—First, from unseasoned timber. Says one, first quoted under this section:

"Green timber will produce deadening; but then, as most timber is dry, this would not make up the thirty per cent. of work which sinks in."

Second, from undercoats of paints or varnish that are imperfectly dried. Mr. Wm. J. Fraser says:

"Sinking-in or withering is a very prevalent deviltry, especially where the painting is hurried too fast, more especially the varnishing part; because, if the undercoats of varnish are not thoroughly hard before the finishing-coat takes its position, then when the first coats do sink, *as they must* in order to harden, the finishing must follow, and alas! you look in vain for lustre."

It is for this reason that a moderately hard coat of leveling varnish is preferable to finish over. Another offers similar testimony, saying:

"Go into your repository and examine carriages that have been finished six or eight months; look at them closely in a good, strong light, and you will, in many cases, see the grain of the wood, which seems almost impossible after receiving so many coatings. Now, I claim that most of this results from soft elastic rubbing varnish, that had not half time to harden."

And still another adds:

"Even though you finish on a poor rubbing varnish, hard and dry, you are much safer as regards deadening, etc., than though you had finished on a good one that was soft and not dry."

Third cause, from absorption by dead and porous undercoats. Mr. B. R. Carpenter, of Groton, N. Y., offers the following valuable testimony on this point:

"The perishing or sinking-in of varnish, I believe, is often caused by absorption by the undercoats of paint. Bodies commonly have from three to five coats of rough-stuff, a portion of which is removed by facing down; to this, two coats of dead color are added, which have little or no elastic qualities, but possess great power of absorption. I have often seen the first coat of rubbing-varnish, when applied to such a surface, so robbed of its elastic quality that it could be removed by the thumb-nail easily, being dry and brittle. Is it unreasonable to suppose that, in such a case, the succeeding coats of varnish will be affected, even to such a degree as to destroy their brilliancy and durability? If this be true—and I certainly believe it is—then the following method will prevent it, and will add to the brilliancy of the finishing coat. After the body is rubbed down, apply a coat of some oily filling or priming that will stop the pores of the rough-stuff (for the best of rough-stuff is more or less porous); allow it to stand two hours, then rub with a cloth to remove the superfluous filling; let stand twenty-four hours, then apply color, which should be made sufficiently elastic with varnish—say with an 'egg-shell gloss'—to bind it firmly, and cause it to 'bear out' the following coats of varnish."

By referring to page 4, the reader will find that Mr. Gardner, in describing the "American Method of Carriage Painting," has made a special point of the necessity of closing the pores of rough-stuff by applying over it a thin coat of Permanent Wood Filling.

Mr. Middleton remarks that varnish is apt to "go sleepy" (the English term for sinking-in) when applied over too quick drying colors, more especially ultramarine blue, and the best way to avoid this is to make the colors more elastic, and consequently less porous, by adding more oil and less drier. Still another writer touches this point when he says briefly:

"What is wanted is uniformity of coats throughout, all being made elastic, for by this means only can varnish be made to stand out well."

A fourth cause of deadening, well worthy of attention, is thus explained by Mr. Carpenter, quoted above:

"All varnish contains gas, and new varnish will deaden when applied to a job (giving it the appearance of having been breathed upon), unless time is given for this gas to evaporate by exposure to the air. It is my habit, when preparing to finish, always to take out my varnish at least an hour before using."

6. "CHIPPING," "FLAKING," AND "SCALING" OR "PEELING."

Definitions.—These terms all indicate the partial separation, more or less marked, of one varnish coat from another, or of the varnish from a coat of paint or other ground. They are often used to express a difference in degree; thus, when the varnish flies off in small particles, it is spoken of as "chipping;" if in larger pieces, that is "flaking;" while "scaling" and "peeling" are applied to still worse cases of the same sort.

Causes.—In many cases of this kind the varnish is condemned; yes, condemned before it is found guilty, and banishment from the shop is the sentence pronounced against it. It is true that the varnish may be at fault, but we believe this is not the most common cause of "chipping." "What is, then?" asks the reader. We answer: "*Lack of uniformity between the different coats in regard to elasticity, and the application either of an elastic over an inelastic coat, or vice versa.*" It takes an experienced and careful painter to judge correctly as to what is required in this respect, but whether he has mastered his art or not, he can produce chipping "to order," easily by disregarding the rule of gradually building up from an elastic ground to a firm surface. We are inclined to criticise many of the remarks, in the essays before us, which bear on this subject. One painter asks:

"Is it not suggestive when I say that varnish will not chip or flake on an elastic surface?"

We answer: Yes, suggestive of the fact that you do not fully understand the cause of "chipping," because an *inelastic* coat of varnish over your elastic surface *would be more than apt to chip or flake*, for the same cause of such *separation* would remain—namely *incongruity*. Several good suggestions are offered, however. One remarks that varnish will flake from color that has not had time to dry, and has a gloss; or, rather, it will crawl off in the first place, and then chip off at last, with no fault on the part of the varnish; and another goes on to explain, that "if the removal of grease or sweet-oil from any part of the work has been neglected before applying a coat of color, the peeling or chipping of such color is certain from those parts of the carriage where the grease was allowed to remain." A surface that has been smoked in the smith-

Do you use one thin coat of Permanent Wood Filling instead of four coats of Lead and Oil for priming?

Do you heat your P.W.F. before putting it on?

Do you prime your (Rough-stuff) with P.W.F.?

Do you use Valentine's Black Japan instead of the old Color and Varnish?

Do you use Valentine's Ivory Black?

Do you keep your brushes clean by using Valentine's Brush-holder?

Do you regulate the temperature of your varnish-room with one of Valentine's Thermometers?

Careful attention to these little details is one of the secrets of avoiding "Deviltries."

The use of harmonious and congruous materials, such as are supplied by some one system, is another.

We aim to collect all the information possible upon the best methods of painting and varnishing and avoiding "Deviltries," and solicit suggestions upon these subjects.

We propose to supplement this by supplying Varnishes as nearly perfect as we can make them, and to constantly make such additions as shall in time make as nearly complete a system of materials as is possible, as a basis of perfect painting.

shop will often cause chipping, as it prevents a close connection of the paint and its ground. Blisters are also attributed to the presence of grease or oil in excess, which has not been removed from the surface. Chipping or peeling may also be caused by the presence of an alkali—for instance, of potash used to remove old paint—and also by washing with soap suds, and not thoroughly cleansing the surface afterward. The following warning is given:

"Rub a piece of hard soap over a varnished spoke, and let it stand for two or three days; at the end of that time you can easily chip, peel, or flake the varnish off with your finger-nail; therefore, it will be well for the painter to avoid using soap in the rubbing of varnish."

It should be mentioned that soap is sometimes necessary, as in cutting down runs, but in such cases the work may be thoroughly rinsed off and all risk avoided. Cracks oftentimes admit moisture, and cause the paint or varnish along their edges to chip off.

Another kind of chipping is mentioned by a correspondent, which we will let him explain in his own words:

"Experience has taught me that there are two kinds of varnish chipping, yet many painters confound the two, though they are entirely different; and yet to the eye they bear a close resemblance, especially when the carriage has been run. In cases of the second kind, it will be observed, upon close inspection, that the color-and-varnish has chipped from the color, of course taking with it the finishing coat of varnish. I have seen many cases of this kind—indeed, it was a common occurrence three or four years ago, whenever a certain prepared color was used."

Lakes sometimes produce chipping. Poor japan will sometimes induce the same effect, and this was probably the cause, in case of the prepared color just mentioned; the japan probably dried too hard, making the color inelastic, and thus prevented the different coats from cohering.

As to preventives for the trouble named, we have endeavored to suggest these as we went along. Where they have occurred, the only cure is to sand-paper or pumice down all the coats that are affected, and then repaint from that point.

7. "CRACKING."

Definition.—The cracking, or breaking up of the surface into parts more or less minute, as in the case of a looking-glass when fractured, is one of the most common afflictions attending the use of varnish.

Causes.—The causes, which are several and well understood by experienced varnishers, may be enumerated briefly as follows: 1. By an inelastic surface underneath, either of varnish or color. Mr. W. Ohaver says:

"I firmly believe that if a job be painted elastic throughout, with the single exception of one non-elastic coat, *this one coat has the percentage in its favor of cracking all the rest.*"

2. By a glossy or too elastic ground. One painter offers the following valuable hint in this connection:

"The drying of glossy color is often so very slow that it does not crack the subsequent coats till the work has been varnished and run out."

There are numerous cases of this kind of *color-cracking*, which must not be confounded, however, with *varnish-cracking*, for the destruction of this color is the cause of the varnish being destroyed prematurely. It will be understood from this fact that varnish has more to contend against than paint, for it covers the latter, and being transparent, many of the misdeeds of the paint are seen through the varnish, and attributed to it. 3. By previous coats of

color or varnish that were not dry when subsequent coats were applied. 4. By destruction of the oily properties of the varnish through exposure to atmospheric influences, such as sudden change from heat to cold, or undue exposure to the sun. 5. By the action of ammonia or other alkalies. 6. By reason of unsuitable driers in the varnish, or its imperfect manufacture. 7. By springing or rupture in the ground-work of the painting.

Mr. Carpenter, previously quoted, offers the following testimony on two of the points named:

"The springing of wood or iron-work will cause paint to crack. We frequently see on the sides of bodies long lines radiating from a point near where a step-bolt passes through the sill, caused evidently by the springing of the sill when persons enter or leave the carriage; and it is plain that the springing of any part of the wood or iron work would have a similar effect. I have also seen a small spot on a carriage very badly cracked, while the rest remained in good condition, and found, upon investigation, that it was kept where that portion of the body was exposed to the sun, by means of a window in the carriage-house."

"Fire-checks" are a species of cracks, very small and running in every direction, forming squares, triangles, and circles, which are sometimes to be seen all over a panel, but which are not generally visible until a fine polish is made with the finishing coat. Mr. Gardner says, in reference to "fire-checks:"

"I proved to my satisfaction, not long ago, that these may be caused by a coat put over a surface not hardened; for in this instance, parts of the job which did not receive that hurried coat turned out splendidly."

Cracks can seldom be filled so that they will not show themselves again in a very short time, and the only effectual way to remove them is to rub them out, and repaint from that point.

8. "GOING CLOUDY," "SMOKY," OR "FOGGY."

Definitions.—These terms, all synonymous, are self-explanatory as to their appearance, and are equivalent to the English expression "blooming," which still more aptly describes that the brilliancy of the varnished surface is obscured by a "bloom," as on a plum or cucumber. When clouding occurs in the case of finishing coats of varnish, it is very troublesome, as it often necessitates rubbing down and revarnishing; but in leveling coats it is of little consequence, and needs no comment. It is an atmospheric deviltry, and in the damp climate of London and vicinity it is more common than in the United States. Mr. Middleton, of London, says:

"Varnish will go cloudy or smoky if, when laying it on, the varnish-room is filled with smoke; or if the weather is foggy, or the atmosphere overcharged with moisture, as in misty weather, when (if the varnish-room is not protected against such influences) smoke, fog, or damp will set into the varnish while it is hardening, and spoil the surface."

This many-named deviltry is almost invariably produced by an over-moist atmosphere. One carriage-painter claims that "blooming" is frequently caused by sulphur fumes emanating from the smith-shop. Moisture condensing on the surface, and leaving a residue of carbonic acid combined with other impurities, is doubtless the most common cause. The trouble may generally be removed by washing and "dry shammying." The Valentines have long been experimenting with a view to produce a varnish that would not readily bloom, and it is generally conceded that they have been eminently successful. One writer has given a number of interesting and instructive illustrations of the conditions under which clouding is liable to occur, which we would be pleased to print in full, but our space will permit us to present only the conclusions which he draws therefrom. He says:

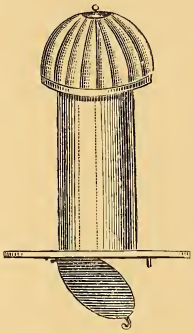
(1.) "In one instance, the fogging of the varnish was owing to lack of proper ventilation in the varnish-room, which was damp, being newly built, and this dampness having no means of escape (as the doors and windows were closed while the bodies were being varnished), settled upon the surface of the varnish, and dried with it, producing the cloudy or smoky appearance."

(2.) "In another case, the varnish, not yet being dry, received a portion of the fog or vapor upon its sensitive surface, which was only to be dissipated by the influence of heated irons; and in some instances the vapor or fog dried with the varnish, in which case the heated irons had no beneficial effect. Revarnishing was the only cure."

The same writer concludes by expressing his emphatic disapproval of the common practice of wetting down the floors of varnish-rooms before varnishing, saying:

(3.) "I am convinced by results that *ventilation and a dry floor are essential, in order to produce unclouded work;* bear in mind—*a dry floor;* for if it is necessary to wet the floor to settle floating matter, the finisher is at fault, because such floating matter should have been removed before the work was brought into the varnish-room. I positively assert that, to varnish work clean, it is *unnecessary to have a single drop of water on the floor.*"

We would add that a ventilator with a revolving top will wholly avoid the last-named difficulty, by carrying away floating dust. We illustrate below the kind of ventilator best adapted for this purpose. Too much emphasis cannot be laid on this matter of ventilation, which is equally necessary in summer and winter. Some varnishers argue that considerable heat is necessary during the drying of varnish; warmth certainly assists the process, but *ventilation is indispensable.* A single instance will serve to illustrate this. A painter in this city recently tried the following experiment: A room was filled with varnished articles, then closed as nearly air-tight as possible, and heated. Forty-eight hours afterward, the varnish showed scarcely any signs of hardening. The skylights were then thrown open, free ventilation permitted, and similar goods were similarly prepared in the same room, when, in a few hours, the varnish became well dried and moderately hard. Fresh air did what heat could not do. It should be borne in mind that *varnish dries and hardens, not by the evaporation of certain of its parts, but by the absorption of oxygen from the air, and the oxidation of those parts.*



We have already examined two classes of varnish defects, one due more particularly to materials and the other to workmanship, and we will now turn to a third class of troubles, which depend mainly upon care, or the lack of it, after the work is completed, and placed in the repository or stable.

9. TURNING BLUE, OR GREEN.

Exclusion of light or the presence of impure air, such as gas from a coal-fire, has the effect of discoloring varnish, generally increasing its yellowish tinge; it then has an effect upon colors beneath it, turning blacks, blues and kindred colors a greenish shade; and in connection with dampness, varnish will become bluish or smoky. The latter effect is more or less superficial, and may generally be removed by frequent washings with cold water, followed by dry shammyings and exposure to the fresh air; but when the body of the varnish has changed color the only cure consists in rubbing down to the color and revarnishing. Accidental and satisfactory exceptions may now and then

A PERFECT surface is surely the ideal of every carriage painter. How to procure it is the important question. Will you rely upon personal skill, shrewd guessing and clever manipulation? These are good, but are they sufficient? Should not system, rule, order and organization have a place? But above all, is not a perfect equipment as to material a first essential? Can any painter enter the race upon any sort of equality without materials at least as good as those of his rivals? Dare any painter who hopes to win, add to the cunning and handicraft required to properly paint a carriage, the labor and responsibility of preparing his own materials? It is important, then, that every painter should look carefully to the character and quality of his materials, and to adhere, if possible, to some uniform system rather than trust to personal selection or preparation.

The Valentine system of varnishes provides for the wants of the carriage painter, from the priming to the finishing (with the exception of the colors, which are otherwise well cared for), furnishing a complete and harmonious development, prepared with all the advantages that capital, organization and experience can afford, besides having been thoroughly tested by some of the oldest and shrewdest carriage builders in the country.

occur. An instance is mentioned in which a gentleman, recently returned from Europe, sent his carriage to the coach-builder to be painted green; it had originally been black, but was found to have changed to a deep rich green, by reason of long storage in a dark, close stable, and so uniformly that it was simply varnished over, the moldings being blacked, and returned to the owner with bill, as if repainted to order. It is mentioned by one writer that the varnishes of different makers often show a great difference in their liability to change color, and he suggests that this quality deserves to be considered in rating the comparative methods of different grades. Valentine's, we think, will be found superior in this respect.

10. MUD-SPOTTING.

Spotting by mud is liable to occur during the summer months, if the carriage is turned out before the varnish is thoroughly hardened. This may be remedied by frequent washings with cold water, which will also help to harden the varnish, and prevent a recurrence of the same trouble. Mud should never be allowed to dry upon a carriage. So long as the mud remains moist, there is but little danger of its leaving spots; but if allowed to remain upon the varnish over night, it will almost invariably leave stains, which, in the case of city mud (containing ammonia) or the mud of lime districts, will generally prove indelible.

11. BLISTERING.

Definition.—The swelling out of parts of the varnish surface, after it is dry and hard, into bubbles or blisters, resembling pustules on the human skin.

This, we are prepared to assert, is never caused by any fault on the part of the varnish, but it seems to be the common opinion of the painters, whose reports are before us, that blistering is in all instances produced by one and the same cause—namely, *the presence of oil or grease on the work*, over which the paint or varnish was applied; and that it generally occurs either from the use of sweet-oil by the body-makers to make the panels fit together more easily, or from exposure to oil, while in the smith-shop, during the process of drilling, etc. This explanation does not fully cover the ground, however, for, in the first place, exposure to sunshine or heat is necessary as a subsequent agency, acting upon the oil, and causing it to expand and lift the covering of varnish above it. Again, dampness or sap in the wood, if exposed to heat, will be liable to produce the same effect, for similar reasons. *Water is frequently absorbed by the rough-stuff during rubbing*, which, if not allowed to evaporate before applying another coat, is liable to cause blistering; this hint deserves special emphasis. And third, an oily varnish, under the influence of heat, will itself supply the conditions for blistering, as is illustrated in burning off an old job of painting, when the varnish blisters and rolls up, but obviously from no fault of the under-coats. Or take varnished iron parts, which are unpainted, and direct sunlight will sometimes be sufficient to blister the surface. Varnished work ought always to be protected as much as possible from direct sunlight or strong heat. Many instances are on record where the surfaces of coaches, pianos and furniture have been blistered by the action of a bubble in the window-pane, which concentrated the sun's rays upon the varnish in the same manner as a burning glass would. One writer calls attention to the following important point, which we do not think is fully understood by the majority of painters. He says:

"If the painter rough-stuff the coach-roof over without cutting off the nibs in the canvas, and giving the canvased surface time to dry, the consequence is that, when the carriage is finished and goes out in the sun, *blisters are sure to occur* wherever these oily nibs have been left. In a word, the sun, by its heat, boils the oil in these little nibs, and raises the blisters."

In many cases there is no cure for blistering but to pumice down the defective surface, and revarnish. In some instances the trouble may be remedied, partially at least, by the following method, described by Mr. Ohaver:

"After blisters have made their appearance, scrape off the paint in the holes, make a few indentures with a brad-awl in the wood, as retaining points, and then give a coat of shellac, and finish with about three puttyings over as many coats of lead."

There is also, what is called "dry blistering," which occurs without the influence of heat, and owing, it is thought, to the employment of putty having insufficient binding quality.

12. CRUMBLING, RUSTING, OR PERISHING.

Definitions.—These synonymous terms are applied to certain conditions of varnish, where there is a gradual loss of brilliancy, and the oily constituents are removed, ending in disintegration and complete destruction of the varnished surface.

Causes.—But little was known on this subject until a comparatively recent date, when it was vigorously discussed by correspondents of "*The Hub*," and much yet remains to be learned about this, the most serious of varnish deviltries. Three causes are now known to exist: 1. Perishing by ammonia. To illustrate this, coat a varnished panel with even the mildest form of ammonia—namely, hartshorn—and it will in a little while eat up the varnish; and the same result occurs when ammonia is present in the air, from stable manure, coal gas, or animal or vegetable matter in a state of decomposition. The street-mud of cities contains a large proportion of ammonia, and is therefore very detrimental to varnish. Mr. Middleton says:

"This pungent alkali exists also in bituminous coal, whence it is thrown off in the form of gas; also in animal life, whence it is thrown off by the respiratory organs; and the atmosphere of large cities is impregnated with it. It has been detected in London on dirty windows, in minute stellated crystals."

Dampness favors its work of destruction. It has been found that if a carriage is kept constantly dry, it is not so likely to be attacked by ammonia fumes. It is generally easy to distinguish where ammonia has destroyed a varnish surface by a variety of symptoms, which one correspondent enumerates as follows:

"How do I know that ammonia did this work? I know it for the reason that nothing but ammonia or alkali will turn varnish rusty, at the same time leaving a bright spot in some protected place, as if to show that the carriage was once glossy; and also where the varnish is cracked, the edges of the cracks are rusted or rotten, which is not so in the ordinary cracking of varnish."

2. Salt sea air and the atmosphere of limestone regions are also very injurious to varnish. Those who are accustomed to spend their summer vacations near the sea-shore will remember the destructive effect of sea air upon the finish of pianos and furniture, and also upon the outside painting of houses. Lime seems to have the effect of absorbing the oily parts of the varnish, robbing it of all power to resist the weather; and mud-spots in a limestone region are therefore particularly destructive to the finish of carriages. 3. "Frost-bitten" varnish has an appearance similar to that destroyed by ammonia, but it lacks some of the distinguishing marks of the latter, as explained by Capt. O'Connell,

who describes at some length the case of a carriage injured in this way, and he concludes by saying:

"It had not the distinguishing marks of ammonia about it—namely, it did not have that rusty appearance that ammonia imparts to varnish; it was not cracked on the spokes in very close parallel rings, and was altogether devoid of any glossy patches on protected parts, which occur in cases where ammonia has been at work. After carefully examining the facts, I came to the conclusion that the carriage was exposed to frequent storms of sleet, and, with this sleet and snow frozen upon it, had stood for hours at a time out of doors, and arriving home late in the evening, was allowed to stand unwashed till the following morning, when the frozen sleet was washed off with hot water;* and this being repeated many times during a very severe winter, had destroyed the varnish all over."

13. INSECT ANNOYANCES.

In concluding this article, there is one other annoyance to which the varnisher is subjected, which is a great source of trouble when he has not the means of making the varnish-room dark—namely, the presence of insects, particularly flies, gnats and millers. Mr. Shettsline mentions that "in varnishing work with two different makers' varnish, one will sometimes repel flies, while the other will attract them, both varnishes claiming to be made the same," and he adds:

"I have experienced considerable trouble on cars in this particular, having had work at times entirely destroyed by flies, and I was compelled to abandon the use in summer of the varnish which attracted them, for one of inferior make which repelled."

By keeping the varnish-room dark, and carefully driving all insects from the room before beginning to varnish, this trouble may be obviated.

The subject of varnish-rooms, into which we are now naturally led, is an all-important one, and in our next edition we hope to present a detailed review of this subject, as *The Hub* has recently offered prizes amounting to $50 for essays on "What Constitute the Requisites of a Perfect Varnish Room," which promise to call out many practical and valuable suggestions.

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* It strikes us that the hot water was quite sufficient cause, without the frost-biting.

The End of the Deviltries.

VALENTINE'S COACH VARNISHES.

STYLE OF PACKAGE

VARNISHES, JAPANS, and P. W. F. 1-gallon Sealed Cans, packed 5 in a case; 5-gallon Sealed Cans, cased separately; 25-gallon Half-Barrels, and 50-gallon Barrels.

ROUGH-STUFF. 1-gallon Tin Pails; 5-gallon Kegs; Half-Barrels and Barrels.

IVORY-BLACK. 1-pound, 2-pound, 5-pound, and 10-pound Patent Cans

IVORY BLACK.

One-pound, two-pound, five-pound, and ten-pound patent cans.

FINISHING.

WEARING BODY VARNISH,

(*For finishing-coats only.*)

This Varnish is very pale, and excels in freedom and safety of working as well as in brilliancy and durability. Though a long time in hardening, it dries out of the way of dust in ten or twelve hours, and sets so slowly that ample time is allowed to accomplish a perfect job on the largest panels. One coat of it is sufficient when used over our HARD DRYING BODY or QUICK LEVELING.

MEDIUM DRYING BODY VARNISH,

(*For finishing-coats only.*)

This Varnish dries out of the way of dust in eight or ten hours, and is the same as our WEARING BODY, with the single exception of hardening more quickly, thus rendering it more desirable for use during hot weather and in tropical climates. One coat of it is sufficient when used over our HARD DRYING BODY or QUICK LEVELING.

ELASTIC GEAR VARNISH,

(*For finishing the wheels and under-parts of Carriages.*)

Though not so durable as our WEARING BODY, it is similar in color, lustre, and working. When flowed over a surface made with our QUICK LEVELING VARNISH, it dries out of the way of dust in eight hours, and hardens quickly.

ONE COAT COACH VARNISH,

(*For finishing-coats on ordinary work.*)

This Varnish is heavier-bodied and more durable than our HARD DRYING BODY, and is especially adapted for finishing work when but a single coat is practicable. It dries in eight to ten hours with fullness and brilliancy, and wears as well as a one-coat varnish can.

RUBBING.

HARD DRYING BODY VARNISH,

(A 4-day rubbing for under-coats on best work.)

This varnish dries in eight to ten hours, and hardens so as to rub well in about four days. It is fully equal to our WEARING BODY in paleness, fullness, and lustre, and is much used for finishing over a leveled surface on hurried work not requiring the greatest durability.

ELASTIC LEVELING VARNISH,

(A 3-day rubbing for under-coats on bodies of Coaches.)

This is a medium between our HARD DRYING BODY and QUICK LEVELING Varnishes. It hardens so as to rub well in three days, and is sufficiently pale for any light colors. From one to three coats should be used according to the class of the work, and be protected by our WEARING BODY.

QUICK LEVELING VARNISH,

(A 2-day rubbing for under-coats on gears, or on bodies requiring dispatch.)

This Varnish dries quicker and harder than our HARD DRYING BODY. In good weather, it will harden so as to rub well in two days without sweating out. It is sufficiently pale for any light work. It should be protected with our ELASTIC GEAR VARNISH, when used on carriage parts, and with our WEARING BODY, when used on bodies.

BLACK JAPAN,

(For producing a jet-black surface on Coaches.)

This is a jet-black Leveling Varnish, which flows and rubs well. Two or three coats should be applied over a black ground, and be protected by our WEARING BODY.

BLACK COLOR-AND-VARNISH,

(A ready-made mixture of drop-black and Varnish for use on Coach work.)

This Black, made of the purest drop-black and the best of varnish, is superior to all mixtures of the kind prepared in the shop, on account of its great uniformity, and being ready for instant use, it will be found a great convenience. Though not so black as our BLACK JAPAN, it is more durable, and rubs well in two days without sweating out. *N. B.—It should be well shaken or stirred before using.*

MISCELLANEOUS.

ENAMELED LEATHER VARNISH,

(*For renovating the black enameled leather of carriage tops.*)

In using this article, first clean the leather thoroughly with soap and water, and when dry, if soft and pliable, put on at once a thin coating of this Dressing, using a medium-size bristle brush. Should the leather be very hard, old and stiff, apply just a coating of our Dark Permanent Wood Filling with a brush or sponge, and *wipe well with rags* so as to leave no P.W.F. on the surface. Let stand over night to dry; then apply a coat of this Dressing, which will dry in an hour or so ready for use.

QUICK BLACK LACQUER,

(*For touching up, in repairing iron-work of gears, etc.*)

This is a jet-black and very quick-drying Lacquer (or Japan), for hastily repairing the iron-work of gears, etc. It dries in an hour and requires to be varnished over. Our BLACK JAPAN is preferable because more durable.

JAPAN GOLD SIZE,

(*For binding, drying, and hardening colors.*)

This is a superior oil-drier, of light color, and strength nearly double that of ordinary Japan. On account of its paleness and the less quantity required, it is especially valuable for use with light paints; and being an oil-drier it is much less hurtful to the work than Japan. Once known, it is indispensable to Coach, Car, and House Painters, for binding colors, mixing rough-stuffs, and facilitating their drying and hardening through.

CROWN COACH JAPAN,

(*For drying and hardening paints.*)

This is a light-colored, strong drying shellac Japan, for hardening colors, and is well adapted to the use of the coach painter.

DARK GROUND ROUGH-STUFF,

(*For producing a hard and level surface on bodies of Coaches and Cars.*)

This is a mixture of mineral substances, combined with great care, so as to furnish a dense body with a sharp grit. It is ground in JAPAN GOLD SIZE, varnish and the purest oil, and is superior to all shop-made rough-stuffs (sometimes erroneously called "fillings"), chiefly on account of its uniformity and its being ready for immediate use. When used over a priming of one coat of PERMANENT WOOD FILLING, the first coat should be made elastic with raw oil, and the following coats reduced with turpentine, if required for working. *N. B.—Stir well before using!*

LIGHT GROUND ROUGH-STUFF,

(*Same article as above except in color, it being light for use on bodies painted in light colors.*)

DARK PERMANENT WOOD FILLING,

(*A patent article for priming outside work, and permanently filling and darkening natural woods.*)

This article, being a very penetrating and non-evaporating anti-damp, of extreme durability, is a perfect and permanent filling for the pores of wood. Experience has proved that it will not only support the color and varnish better and longer than the old method of lead priming, but that on account of its permanent elasticity, it will neither crack nor flake off; besides which, it saves time, labor and cost, and is more convenient, cleanly and healthful.

LIGHT PERMANENT WOOD FILLING,

(*Same article as above except in color. Being light, it fills without staining the natural wood, and is adapted for use over the* LIGHT GROUND ROUGH-STUFF *on Bodies painted in light colors.*)

VALENTINE'S IVORY BLACK,

(*A superior article of* DROP BLACK, *ground with* VERY BEST MATERIAL, *to the* FINEST POSSIBLE DEGREE.)

To make "quick color," simply dilute with turpentine to the proper consistency for spreading with a camel's hair brush. For ordinary work, add a little raw linseed oil, using judgment not to have it dry with more than an "egg-shell gloss."

COMPARATIVE VIEW

OF THE

Drying, Hardening, and Durability of VALENTINE'S Coach Varnishes.

FINISHING.	Hours required in drying free from dust.	Days required in hardening to rub.*	Days required in hardening ready for use.	Months of Durability.
WEARING BODY VARNISH, ... (*For finishing-coats only.*)	10	....	4 to 5	13
MEDIUM DRYING BODY VARNISH, . . (*For finishing-coats only.*)	9	....	3 to 4	12
ELASTIC GEAR VARNISH, ... (*For finishing the wheels and under parts of carriages.*)	9	....	2 to 3	10
ONE COAT COACH VARNISH, . . . (*For finishing only.*)	8	....	1 to 2	8
RUBBING.				
HARD DRYING BODY VARNISH, . . . (*For under-coats on best work.*)	7	4	1	6
ELASTIC LEVELING VARNISH, . . . (*For under-coats on bodies of coaches.*)	6	3	....	4
QUICK LEVELING VARNISH, ... (*For under-coats on gears, or on bodies requiring dispatch.*)	5	2	....	2
BLACK JAPAN, ... (*For producing a jet-black surface on coaches.*)	5	2	....	2
BLACK COLOR-AND-VARNISH, . . . (*For producing a jet-black surface.*)	5	2	....	2 to 3

* By "hardening to rub," we do not mean merely drying sufficiently to flat with pumice-stone, ready for another coat, but *sufficiently to rub down to a hard surface.*

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